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LESIONS FOUND IN TWELVE HUNDRED AND FIFTY X-RAY EXAMINATIONS OF THE GASTRO-INTESTINAL TRACT

BY

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"The study of living pathology" is claimed by Deaver(1) to be the important contribution of modern surgery to the medical sciences. We believe that a claim to this distinction can more justly be made by the science of roentgenology, and seven years before Deaver's article, Leonard(2) had already prophesied that roentgenology would make this contribution, and this prophecy is rapidly being fulfilled. Leonard (in 1915) said, "The living anatomy, physiology and pathology of the digestive tract has yet to be written, and this can only be done as the results are determined by the study of the living patient by the roentgen method."

The advantage of studying living pathology by x-ray over the exploratory operation lies in the ability to observe variations from the normal in function as well as abnormalities in structure. Structural pathology only can be studied by the surgeon. Roberts(3) considers one of the weak points in x-ray studies of the gastro-intestinal tract to be the frequent failure to find pathology which is actually present and says "a negative roentgen-ray diagnosis of a gastro-intestinal lesion should never be regarded as final in the exclusion of gastro-intestinal disease."

This warning is very proper but entirely unnecessary so far as the x-ray specialist is concerned. The same warning is applicable to negative exploratory operations, for organic disease of the gastro-intestinal tract cannot be excluded by inspection of the outer coats of the hollow viscera.

The roentgenologist therefore not only does not claim his negative findings to be conclusive bot he does not accept the negative exploratory operation as conclosive, unless the hollow viscera are all split open and inspected and the solid viscera all removed and sliced by a tissue pathologist, a procedure which might be embarrassing to the patient.

The roentgenologist asks only that he be considered a consulting specialist, and that his findings be properly correlated with the clinical

symptoms and history, either by himself or by the clinician in charge of the patient; that his positive findings be given the consideration they deserve and that his opinions carry the weight which his "pathologic knowledge, experience and scientific honesty"(3) entitles them to.

This report of 1,250 x-ray examinations of the gastro-intestinal tract has a three-fold object. First, to tabulate the relative frequency of findings in patients coming to the general practitioner with chronic sympoms referred to the digestive tract; second, to illustrate the importance of thorough gastro-intestinal x-ray examinations, no matter now definite the symptoms may be; third, to demonstrate the scope of x-ray work in gastro-intestinal diseases.

These patients were examined between January, 1915, and March 1st, 1920, and were referred to us by about 40 physicians and surgeons of Arizona. Of the total number, 485 came without a history or any information as to the character of the symptoms, but with the simple request that a gastro-intestinal x-ray examination be made; 332 came with symptoms indicating stomach or duodenal lesions; 218 came with symptoms suggesting gallbladder disease; 160 came with symptoms suggesting appendix disease, and 52 came with symptoms localized in the colon.

The lesions found in the 485 patients with indefenite symptoms are shown in Table I. It will be seen that the findings were negative in 114 patients; that uncomplicated appendix disease was found in 109; duodenal ulcer in 33; stomach ulcer in 20; adhesions in 51; chronic gallbladder disease in 37; tuberculous colitis in 20; diverticuli of the colon in 5; stomach cancer in 6; cancer of the colon in 4, with isolated cases of various lesions. There were 71 patients in this group having multiple lesions.

The lesions found in the 332 patients coming with symptoms of stomach or duodenal disease are shown in Table 2. Uncomplicated gastric or duodenal lesions were found in 169; multiple lesions in 33, and negative findings in 64.

The lesions found in the 218 patients with symptoms of gallbladder disease are shown in Table 3. In 103 of these, uncomplicated gallbladder disease was diagnosed with the x-ray findings; gallbladder disease, complicated by lesions in other organs, was found in 22 patients; lesions outside of the gallbladder were found in 36 patients, while the examinations were negative in 57 patients.

The lesions found in the 163 patients coming with symptoms pointing to appendix disease are shown in Table 4. Pathological conditions in the appendix or appendix region, without complications, were found in 113 of these cases; appendicitis, complicated by other lesions was found in 14 patients; lesions elsewhere then the lower right quadrant were found in seven patients and 29 gave negative results.

The lesions found in the 52 patients with symptoms localized in the

colon are shown in Table 5. It will be noted that the colon diseases were usually discovered in patients having indefinite symptoms (Table 1).

In Table 6 the pathological conditions found in the entire series are listed in the order of their relative frequency.

NEGATIVE x-ray examinations in 293 out of 1,250 patients, with definite indications of digestive lesions, is not surprising when analyzed. Such results are due to one of three causes: (1) failure on the part of the clinician to realize the necessity of a complete examination; (2) extragastric diseases producing stomach symptoms; (3) failure to demonstrate a lesion present. The first of these evils is gradually being eliminated in our work, but is still the cause of the majority of erroneous negative results. A brief inspection of Tables 2 and 3 will demonstrate the gravity of this error. Out of the 332 patients sent with probable diagnosis of stomach or duodenal lesions, the pathology was found entirely outside of the stomach and duodenum in 57 patients, or 17 per cent. Of the patients sent with definite gallbladder symptoms, the lesions were found elsewhere in 35 patients, or 16 per cent. It is reasonable to suppose, then, that when we are asked to confine our examination to the gallbladder or stomach, we stand a 16 or 17 per cent chance of making an erroneous negative report, for which we are not responsible.

Patients with reflex stomach symptoms from decompensation, aortitis, nephritis, pulmonary tuberculosis, pelvic disease, etc., naturally give negative x-ray findings. There are many such in this series, a few of which are listed under the "Negative Findings." In many other cases we were able to make definite suggestions of probable pathology, without being able to demonstrate it roentgenographically; for example, ovarion disease, by excluding the cecum and appendix in lower right quadrant discomfort.

Failure to demonstrate the lesions present have been frequent enough, but we believe have not been so frequent a cause of negative reports as the other two reasons.

CHRONIC APPENDICITIS: The most interesting observation in our work has been the frequency of chronic appendix disease. The literature of the past ten years on chronic appendicitis is strikingly similar to that of 25 or 30 years ago on acute appendicitis, both in the wide variety of opinions as to the existence of such a condition, and the proper treatment for it when its reality is admitted. We will not, in this paper, attempt to review the literature on this subject, having done this in a previous report. In a gastro-intestinal examination, the roentgenologist may find demonstrable pathology in the appendix, either as the only abnormality, or in association with other lesions. This pathology may be visualized in an appendix which is retrocecal and tender, one which is kinked, constricted, irregularly filled, adherent to adjacent

structures, containing concretions, or atonic and unable to empty. He may justly infer appendix disease from other pathology found in the ileo-cecal region, such as adhesions, Lane kinking of the ileum, obstruction at the valve, cecal stasis, etc. On the basis of such findings, he is entitled to report that there is a pathological appendix present and, that, in his opinion, this is capable of producing local or reflex symptoms, or both. Then the clinician or surgeon must decide several things which the x-ray examination cannot determine; (a) whether the diseased appendix is actually the cause of the symptoms complained of by the patient; (b) if so, whether there are associated causes outside of the gastro-intestinal tract; (c) if other gastro-intestinal lesions are shown by x-ray, what part they play in the symptoms, and whether they are surgically remediable along with the appendix; (d) to what extent the secondary effects of appendicitis,—like atony of the colon, constipation, ptosis of the cecum, neuroses of the stomach, will be corrected by the removal of the appendix and subsequent medical treatment; (e) whether the patient will be amenable to postoperative medical treatment, which frequently must be prolonged.

In the series of 1,250 patients, no fewer than 392 showed pathological appendices, this being the only demonstrable pathology in 252, or 20 per cent. There were 25 additional cases with ileo-cecal adhesions where the appendix was not visualized, 44 cases of combined ulcer and appendicitis, and 56 cases of combined appendix and gallbladder disease.

CHRONIC CHOLECYSTITIS: Next to appendicitis, chronic gallbladder disease was the most common lesion found. We wish to state, without apology, that we follow the teaching, technic and conclusions of George (4) in gallbladder work; namely, (1) the normal gallbladder is not demonstrable on the radiograph; (2) an unmistakable gallbladder shadow means a diseased organ, either with a thickened wall, or infected bile; (3) such a shadow, correctly interpreted, whether stones are demonstrated or not, means a surgical condition. We do not, therefore, regard it as an error when we diagnose chronic cholecystitis and fail to show stones which are afterwards found at operation. The finding of assist the surgeon in persuading the patient to be operated upon. As stones does not make the condition any more surgical, although it may a matter of pathology, an infected gallbladder is more of a surgical emergency during the early stages than it is during the later stage of stone formation; for the stones, in themselves, do no great damage, unless one becomes impacted in the common duct. However, it is always gratifying to demonstrate stones, because most patients will consent to have them removed, when they cannot always see the necessity of removing or draining a gallbladder containing purulent bile.

ULCER OF THE DUODENUM ranked third in the number of lesions found, being demonstrated 169 times. It was the only lesion in 118 patients, and was found to exist in combination with other gastro-

intestinal lesions in 51 patients. We have come to have little faith in the reliability of pain as a differential point between stomach and duodenal ulcer, either as regards its character, location or relation to meals. A deep ulcer high on the lesser curvature may give the classical pain one-half to two hours after eating and relieved by meals, but ulcers located, as they usually are, close to the pylorus, cannot be differentiated by clinical symptoms from duodenal ulcer. Nor will duodenal ulcers in the post-pyloric groove give the same clinical symptoms as ulcer located on the wall of the first part of the duodenum. Duodenal ulcer is the easiest lesion in the digestive tract to diagnose, and a negative finding here is more conclusive than anywhere else. It is possible to miss an ulcer of the duodenum, but careful technic should give results better than 90 per cent correct.

With regard to STOMACH ULCER, our statistics give the usual results that this lesion is about 75 per cent as frequent as duodenal ulcer. We found 120 cases of stomach ulcer, this being the only pathology demonstrated in 80 patients, and being found in combination with other lesions in 40. There is more likelihood of error in diagnosing stomach ulcer than in duodenal ulcer, owing to the reflex effects of extragastric diseases, producing contractural deformities and spasm of the stomach. However, the crater is just as conclusive in the stomach, when it is found, as it is in the duodenum. The error will usually occur in missing the shallow ulcer or overlooking indurated areas and mistaking them for spastic deformities. Even when the clinical evidence of stomach ulcer is unquestionable, the x-ray evidence should not be neglected, as it frequently gives a definite suggestion of beginning malignancy. Without taking sides in the controversy regarding the medical or surgical treatment of ulcer, there are three types of stomach ulcer which demand surgical procedure; those producing pyloric obstruction, those with threatened or actual perforation, and those presenting the characteristics of beginning malignancy. The first two of these conditions are readily shown by x-ray, and the third can frequently be demonstrated.

CANCER OF THE STOMACH was shown in 49 patients, a few of which were in the operable stage. A demonstration of stomach cancer will graphically impress the necessity for early examination, for prompt removal of degenerating ulcer, and the fact that stomach cancer may reach an advanced stage with very few symptoms.

Syphilis of the stomach may be diagnosed as cancer. though there are certain distinguishing features. Syphilis may produce the water-bottle stomach with contracted pyloric end, or a localized contraction from scar, or show defects from gummata protruding into the stomach.

ADHESIONS involving the colon were found in 55 cases, 38 of these giving indefinite symptoms. This does not include ileo-cecal adhesions, which are listed under appendix disease. Colonic adhesions include Jackson veil, adhesions at the flexures, in the descending colon, or, as

was most frequently the case, in the pelvic portion of the descending colon.

DIVERTICULI of the colon was diagnosed 11 times. Twice it has been reported back by surgeons as not being found at operation. We believe, however, that most of the others are unmistakable. Diverticuli of the colon can give very puzzling symptoms, frequently simulating ureteral stone or ovarian pain.

TUBERCULOSIS COLITIS is the most recent valuable contribution to roentgen diagnosis. The work on this condition has been perfected chiefly by Brown and Sampson (5), and their reports are quite conclusive. Those cases examined by us since reading their publications, and other cases found in our records, give the appearances described by these workers. We find the cecum involved most frequently; we have been able to diagnose three cases of tuberculous appendicitis in which the cecum was not involved. The typical x-ray finding is a marked intolerance on the part of the cecum or other portion of the colon involved for the barium meal, which is rapidly expelled into the healthy portion of the colon. If a tuberculous cecum is filled by an enema, the cecum will very quickly be seen to contract and expel its contents. This behavior of a tuberculous cecum or colon has, no doubt, been observed by every roentgenologist of experience, but its significance has not been appreciated. We observed it several times before Brown's article appeared, but did not attach the importance to the phenomenon which it deserves.

PYLORIC STENOSIS of infancy is an interesting condition which is sometimes difficult to differentiate from the related condition of pylorospasm. The differentiation is important since the first is a surgical and the latter a medical condition. We have examined eight infants for this condition, demonstrating it twice, both babies being cured by operation. Five of the infants showed spasm of the pylorus and one proved to be congenital syphilis involving the stomach.

COMBINED LESIONS: The most interesting and instructive cases in this series are those showing combined lesions. This group, no doubt, would have been larger had all the patients been thoroughly examined. Several cases in whom the examination was stopped when the first lesion was found showed other lesions at operation.

In the series 136 patients showed two distinct lesions and 13 had triple lesions. These are shown in Table 7. It will be seen that there were 56 patients with combined gallbladder and appendix disease, 25 patients with duodenal ulcer and appendicitis, 19 patients with stomach ulcer and appendicitis, 11 patients with both stomach and duodenal ulcer; three cases of duodenal ulcer and gallbladder disease; two cases of stomach ulcer and gallbladder disease, etc.

The triple lesions consisted of 10 patients with gallbladder and appendix disease with ulcer of duodenum or stomach, one case of gall-

bladder disease with double ulcer, one case of appendicitis with double ulcer, one case of gallbladder disease, stomach ulcer and tuberculous colon.

OPERATIVE FINDINGS: Through the courtesies of Drs. Willard Smith, W. O. Sweek, E. Payne Palmer and G. E. Goodrich, we have been furnished with the operative findings on 167 patients of the series reported above. In 40 of these patients there was more or less disagreement between the x-ray and operative findings, while in 127 the x-ray examinations correctly foretold the operative findings.

The forty cases of disagreement between the x-ray report and operative findings are shown in Table 8. In the first 10 patients the lesions were found, at operation, in organs not included in the x-ray examination. The next seven cases were reported negative and were operated, subsequently, for acute appendicitis; they are included here as possible cases of chronic appendicitis overlooked by us and allowed to develop into acute attacks. There are, then, in reality, only 23 cases out of 167 in which there was actual disagreement between the x-ray report and the operative finding. The next eight cases were cases reported as ulcer by us. but ulcer was not found by palpation when the abdomen was opened. Though we do not consider the search for ulcer to have been adequate, to avoid argument we are listing these seven cases as errors of the x-ray report. The remaining 15 cases were clearly errors of the roentgenologist, which have been profitable in teaching lessons of caution and conservatism. Some of the errors, like Case 40, were of minor importance; in others the x-ray appearances were very deceptive and led to diagnoses which were quite wide of the mark.

CHART 1

GASTRO INTESTINAL PATHOLOGY SHOWN BY X-RAY IN PATIENTS WITH INDEFINITE SYMPTOMS—485 CASES

No Pathology found	114	cases	23.5%
Chronic Appendicitis	109	"	
Intestinal Adhesions	51	"	
Cholecystitis	37	"	
Combined Gallbladder and Appendix Disease	32	"	
Duodenal Ulcer	33	"	
Stomach Ulcer	20	"	
Chronic Appendicitis with Stomach or Duodenal Ulcer	24	"	
Tuberculous Colitis	20	"	
Appendix and Gall Bladder Disease with Ulcer of Stomach or Duodenum	6	"	
Cancer of the Stomach	6	"	
Diverticuli of the Colon	5	"	
Cancer of the Colon	4	"	
Syphilis of Stomach	2	"	
Incompetent Ileo-cecal Valve	3	"	
Gall Bladder Disease with Ulcer	2	"	
Ulcer with Tuberculous Colitis	3	"	

ONE CASE EACH OF	Chronic Appendicitis with Ureteral Stone
	Chronic Appendicitis with Duod. Diverticulum
	Spondylitis
	Cancer of Lungs and Liver
	Kidney Stone
	Duod. Ulcer, Gallbladder Dis. with Ileo-cecal Valve Obstruction
	Adhesive Pericarditis
	Gallbladder Disease with Tuberculous Colitis
	Retroperitoneal Tumor

CHART 2

GASTRO INTESTINAL PATHOLOGY SHOWN BY X-RAY IN PATIENTS WITH DEFINITE STOMACH SYMPTOMS—332 CASES

No Pathology found	64	cases	19.5%
Duodenal Ulcer found in	71	"	
Stomach Ulcer found in	56	"	
Cancer of Stomach found in	42	"	
Chronic Appendicitis	28	"	
Gallbladder Disease	18	"	
Stomach and Duodenal Ulcer	11	"	
Ulcer and Chr. Appendicitis	11	"	
Infantile Pylorospasm	5	"	
Stomach Syphilis	4	"	
Gallbladder and Appendix Dis.	4	"	
Tuberculous Colitis	3	"	
Congenital Pyloric Stenosis	2	"	
Ulcer and Gallbladder Dis.	2	"	
Ulcer, Gallbladder and Appendix Disease	2	"	

ONE CASE EACH OF	Appendicitis and Diverticuli
	Ulcer and Tuberculous Colon
	Cancer of Esophagus
	Aneurism of Desc. Aorta
	Diverticuli of Colon
	Duodenal Ulcer and Stomach Cancer
	Benign Tumor of Stomach

CHART 3

GASTRO INTESTINAL PATHOLOGY SHOWN BY X-RAY IN PATIENTS WITH DEFINITE SYMPTOMS OVER GALL BLADDER—218 CASES

No Pathology found	57	cases	26%
Chronic Cholecystitis	103	"	
Cholecystitis with Appendicitis	15	"	
Chronic Appendicitis alone	10	"	
Duodenal Ulcer	13	"	
Ulcer with Appendicitis	5	"	
Stomach Ulcer	4	"	
Gallbladder Dis. with Ulcer	6	"	
Stone in Liver	1	case	
Diverticuli of Colon	1	"	
Aneurism of Desc. Aorta	1	"	
Chr. Appendicitis with Duodenal Diverticulum	1	"	
Gallbladder and Appendix Dis., with Ulcer	1	"	

CHART 4

GASTRO INTESTINAL PATHOLOGY FOUND BY X-RAY IN PATIENTS WITH SYMPTOMS OF APPENDIX DISEASE—163 CASES

No Pathology found	29	cases
Chronic Appendicitis	104	"
Ileo-cecal Adhesions	9	"
Appendicitis with Ulcer	6	"
Appendicitis with Gallbladder Disease	5	"
Cholecystitis	3	"
Appendicitis with Tuberculous Colitis	2	"
Tuberculous Colitis alone	3	"
Stomach Ulcer, Cholecystitis with Tuberculous Colitis	1	case
Chronic Appendicitis with Spondylitis	1	"

CHART 5

GASTRO INTESTINAL PATHOLOGY FOUND BY X-RAY IN PATIENTS WITH SYMPTOMS OF COLON DISEASE—52 CASES

No Pathology found	17	cases
Colon Adhesions	14	"
Incompetent Valve	7	"
Diverticuli of Colon	3	"
Cancer of the Colon	3	"
Ileo-cecal Adhesions	2	"
Tuberculous Colitis	2	"
Chronic Appendicitis	1	case
Enlarged Spleen	1	"
Appendicitis and Gallbladder Dis.	1	"
Rectal Stricture	1	"

CHART 6

SUMMARY OF PATHOLOGICAL CONDITIONS FOUND BY X-RAY IN 1250 PATIENTS EXAMINED FOR GASTRO INTESTINAL LESIONS

NEGATIVE GASTRO-INTESTINAL FINDINGS

Wholly Negative	281	cases	
—with Enlarged Spleen	1	"	
—with Aneurism	2	"	
—with Ca. of Esophagus	1	"	
—with Spondylitis	2	"	
—with Kidney Stone	2	"	
—with Pericarditis	1	"	
—with Ca. of Lungs	2	"	
—with Retroperit. Tumor	1	"	
Total Cases with Negative Findings	293	"	or 23.5%

APPENDIX PATHOLOGY

Chronic Appendicitis alone	252	cases
Ileo-cecal Adhesions	25	"
Chr. Appendicitis with Gallbladder Disease	56	"
Chr. Appendicitis with Ulcer	44	"
Chr. Appendicitis with Gallbladder Disease and Ulcer	10	"
Appendicitis and Ureteral Stone	1	"
Appendicitis and Duod. Diverticulum	1	"
Appendicitis and Colon Diverticuli	1	"

Appendicitis and Tb. Colitis	1	"	
Appendicitis and Spondylitis	1	"	
Total Cases wits Appendix Disease	392	"	or 31.3%

GALLBLADDER DISEASE

Chronic Cholecystitis (Stones shown in 46 cases)	161	cases	
Gallbladder and Appendix Dis.	56	"	
Gallbladder Dis. with Ulcer	10	"	
Gallbladder and Appendix Disease with Ulcer	10	"	
Gallbladder Dis. with Tb. Colitis	1	"	
Gallbladder Dis., Tb. Colitis with Ulcer	1	"	
Total Cases with Gallbladder Disease	239	"	or 19%

DUODENAL ULCER

Duodenal Ulcer alone	118	cases	
Duodenal Ulcer and Appendicitis	25	"	
Duodenal and Stomach Ulcers	11	"	
Duodenal Ulcer and Gallbladder Disease	3	"	
Duodenal Ulcer, Gallbladder Dis. and Appendicitis	7	"	
Duodenal Ulcer and Tb. Colitis	3	"	
Duodenal Ulcer and Stomach Cancer	1	"	
Duodenal and Stomach Ulcers with Gallbladder Disease	1	"	
Total Cases with Duodenal Lesions	169	"	or 13.5%

STOMACH ULCER

Stomach Ulcer alone	80	cases	
Stomach Ulcer with Appendicitis	19	"	
Stomach and Duodenal Ulcers	11	"	
Stomach Ulcer with Gallbladder Disease	2	"	
Stomach Ulcer, Gallbladder Disease and Appendicitis	3	"	
Stomach Ulcer and Adhesions	2	"	
Stomach and Duodenal Ulcers with Gallbladder Disease	1	"	
Stomach Ulcer and Tb. Colitis	1	"	
Stomach Ulcer, Gallbladder Disease and Tb. Colitis	1	"	
Total Cases showing Stomach Ulcer	120	"	or 9.6%

Colonic Adhesions	55	cases
Cancer of the Stomach	49	"
Tuberculous Colitis	31	"
Diverticuli of the Colon	11	"
Incompetent Ileo-cecal Valve	10	"
Cancer of the Colon	8	"
Syphilis of the Stomach	6	"
Duodenal Diverticuli	4	"
Congenital Pylorospasm	5	"
Congenital Stenosis	3	"
Stone in Liver	1	"
Retroperitoneal Sarcoma	1	"
Benign Tumor of Stomach	2	"

CHART 7

COMBINED LESIONS IN THE GASTRO INTESTINAL TRACT SHOWN BY X-RAY IN 1250 PATIENTS WITH DIGESTIVE SYMPTOMS

149 CASES, OR 12 PER CENT

Gallbladder and Appendix Disease	56	cases
Duodenal Ulcer and Chr. Appendicitis	25	"
Stomach Ulcer and Chr. Appendicitis	19	"
Both Stomach and Duodenal Ulcers	11	"
Duodenal Ulcer and Gallbladder Disease	3	"
Stomach Ulcer and Gallbladder Disease	2	"
Duodenal Ulcer and Tuberculous Colitis	3	"
Appendicitis and Ureteral Stone	1	"
Appendicitis and Duod. Diverticulum	1	"
Appendicitis and Colon Diverticuli	1	"
Appendicitis and Tuberculous Colitis	1	"
Duodenal Ulcer and Stomach Cancer	1	"
Gallbladder Disease and Tuberculous Colitis	1	"
Gallbladder Disease, Appendicitis and Stomach or Duodenal Ulcer	10	"
Gallbladder Disease with both Stomach and Duodenal Ulcers	1	"
Appendicitis with both Stomach and Duodenal Ulcers	1	"
Gallbladder Disease, Stomach Ulcer and Tuberculous Colitis	1	"

CHART 8

ERRORS IN X-RAY DIAGNOSIS ON 167 PATIENTS

No.	*x-ray serial*	*x-ray report*	*Operative findings*
1.	3810	Ileo-cecal and colon adhesions; g.b. not exam.	Asc. colon dense adhesions; gallstones
2.	6301	Duodenal ulcer; appendix not examined	Old duod. ulcer; chr. adherent appendix
3.	4047	Duod. adherent to g.b.; appendix not exam.	Adherent g.b.; chr. adherent appendicitis
4.	8481	Stomach only exam.; negative	Tuberculous bowel and appendix
5.	4100	Stom. and colon neg.; gallbladder not exam.	Chr. cholecystitis; chr. appendicitis
6.	8042	Stomach examined; neg.	Chr. appendicitis
7.	4494	Stomach examined; neg.	Chr. appendicitis
8.	3171	Stomach examined; neg.	Tb. peritonitis
9.	4618	Chr. appendicitis; cecum only examined	Duod. diverticulum; chr. appendicitis
10.	9304	Stomach only exam.; negative	Perforated appendix
11.	6346	Stom. and g.b. neg.; cecum not examined	Acute appendicitis later
12.	6020	Stomach only exam.; negative	Acute appendicitis later
13.	8470	Negative	Adherent subacute appendix
14.	6074	Negative	Acute appendicitis later
15.	4543	Negative	Acute appendicitis later

16.	3812	Chr. appendicitis; chr. gallbladder dis.	Acute, gangrenous appendix later; g.b. not exam.
17.	2987	Pyloric ulcer; chr. appendicitis	Chr. appendicitis; no ulcer on palpation
18.	6705	Duod. ulcer; ptosis of cecum	Chr. appendicitis; no ulcer felt
19.	4196	Duodenal ulcer	Chr. appendicitis; no ulcer felt
20.	8809	Duod. ulcer; chr. appendicitis	Chr. appendicitis; no ulcer felt
21.	8660	Pyloric ulcer	Subacute appendicitis; no ulcer felt
22.	7099	Pyloric ulcer	Acute appendix on chronic base; no ulcer eflt
23.	1467	Stomach ulcer; chr. appendicitis	Chr. appendicitis; no ulcer felt
24.	6082	Enlarged and thickened g.b.; pyloric ulcer; chr. appendicitis	Very large g.b. with 586 small stones; no ulcer felt; pancreatitis; appendix not molested
25.	5109	Cancer of stomach	Disappeared under antiluetic treatment
26.	7308	Malignant colon	No cancer; adhesions at splenic flexure.
27.	9008	Cancer splenic flexure	Non-malignant constriction at splenic flexure
28.	10112	Duod. adhesions from gallbladder disease	Pyelitis and kidney abscess retroperitoneal duodenal adhesions; chr. appendix
29.	3010	Tumor of stomach	Pylorus removed; found normal
30.	9578	Duodenal ulcer	Carcinoma of pancrease, involving gallbladder
31.	7531	Diverticuli of colon	Pelvic adhesions of colon; no diverticuli found
32.	9916	Diverticuli of colon	Mesenteric adhesions; no diverticuli found
33.	4976	Normal stomach; chr. appendicitis	Gastric ulcer; chr. appendicitis
34.	8348	Cancer of pylorus	Cholecystitis with stones and adhesions to pylorus
35.	4110	Chr. gallbladder disease	G.b. normal; chr. appendicitis
36.	3102	Gallbladder dis. with one stone	Thickened g.b.; no stone
37.	805	Duod. ulcer	Chr. g.b. dis. with stones and adhesions; no ulcer found
38.	10909	Gallbladder dis. with stones	Chr. gallbladder dis. with no stones
39.	1322	Normal	Pyloric ulcer
40.	11573	Retroperitoneal sarcoma	Retroperitoneal carcinoma of the lymph glands

THE AMERICAN YOUTH AS MIRRORED BY THE WORLD WAR: SOME TIMELY LESSONS

BY

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President's Address, Annual Meeting Arizona State Medical Association, Nogales, Arizona, April 16, 1920.

So long ago as 1879 that "most accomplished soldier in our service," the late General Emory Upton[1], addressed himself to the task of interpreting the lessons of the Civil war to his countrymen for the improvement of our military system. His recommendations had behind them all the prestige of his brilliant military career. They had the advocacy and support of the great soldier who then commanded American armies, General Sherman. They embodied the practical lessons of the Civil war and the results of military science throughout the world. Yet his voice was as the voice of one crying in the wilderness. The government did not even print his report, but, with those of his associates, it was filed in manuscript and forgotten among the millions of documents in the archives of the war department. General Upton did not live to see a single recommendation of his operative in the military policy of the United States. Fortunately for us, his writings were brought to the attention of the war department through the efforts of a confrere, Elihu Root, then secretary of war, who said: "His work exhibits the results of such thorough and disseminating research, such a valuable marshalling of facts of our military history and such sound and ably reasoned conclusions drawn from those facts as to the defects and needs of our military system, that it clearly ought to be made available for the study of our officers and for the information of all who may be charged with shaping our military policy in the future." In 1904 "Upton's Military Policy of the United States" became a text book approved by the general staff of the army, known as War Department Document Number 290.

It is my opinion that Upton's work had more to do with giving us the "Selective Service Law of 1917" than any other writing or set of writings in the whole library of the war department. It moulded the opinion of the general staff, stiffened the backbone of congress and upheld the arms of the president. It gave us, within a very few months, that onderful army of democracy, gave it to us at a time when our military policy (if we had any) was obsolete and chaotic—for be it remembered, gentlemen, that up to that day we were so obsessed with keeping out of war that as a nation we were not allowed to inquire about our preparedness for war or vote a single dollar for increase of army or navy[2]. Then, as never before, did we realize the full import of those prophetic words of General Upton, "In time of war the civilian as much as the soldier is responsible for defeat and disaster. Battles are not lost alone on the field; they may be lost beneath the dome of

the Capitol, they may be lost in the cabinet, or they may be lost in the private office of the secretary of war. Wherever they may be lost, it is the people who suffer and the soldiers who die with the knowledge and the conviction that our military policy is a crime against life, a crime against property, and a crime against liberty."

A mighty nation awoke from its lethargy and obsession and at the eleventh hour created that world marvel, the grand army of the American republic. Now that the World war has passed into history, how has it mirrored the American youth? As a fighting man how did he compare with the soldiers of the world? Survey him from every angle and analyze your results. That is what many medical men and sanitarians are doing today. Medical literature is full of observations on the soldier and interpretations on lessons from the World war. I rejoice in this prodigality, for there is a vast harvest of good to come to this nation from a wholesome acceptance of the lessons of this war.

The purpose of these remarks is to interest the medical profession of Arizona, first in the tabulation and interpretation of some of the lessons of the great war and secondly to secure your co-operation in bringing these lessons to your clientele, to the family, wherein you have an opportunity almost unbounded and priceless to inculcate medical truths throughout the "seven ages of man." We have time to consider only a few interpretations, in fact our statistics are still in the making, but if I succeed in interesting you in the potentialities of these lessons for future good my feeble effort shall not have been in vain.

When a former secretary of state reassured his countrymen that, in the event of an invasion of the United States by a foe, ere sundown a million men would rush to the colors armed with pitchforks, he assumed the wrong premise. In the first place, as our army and militia recruiting officers can testify, our youth did not rush to the colors, though danger threatened. In the second place this statesman did not consider in his calculations those great eliminating forces, the local examining boards and the army medical examiners, who would have cut his agrarian million down to 650,000 pitchforks by the end of the first week. Then, as a matter of fact, instead of a million, nearly five million men were mobilized in the military forces of the United States (army, navy, marines)[3]. Oh, the chagrin and awakening shock of the exemption boards as they reject 29 per cent of those called, and the army examining boards who must reject another 5.7 per cent of the original 100 per cent of those called to the colors. Gentlemen, one out of every three rejected as unfit for military duty is a dark blot upon our medical escutcheon; as apostles of hygiene and preventive medicine we have fallen short of our full duty and opportunities in the past, for most of those disqualifications are to be found classed among preventable diseases or remediable defects.

Consider with me some of the more important disqualifying factors

as tabulated by the surgeon general of the army[1]. Defects of feet (flatfoot) 11-13 per cent. Can it be that evolution through its style in foot wear and countless sedentary occupations is breeding in our youth the effemiate Chinese foot? In war, Mercury, shod in his winged sandals, should be our ideal. Would present day industrial efficiency be promoted by better feet? Whether industrial efficiency be promoted or not, should we as physicians not demand that our young men be able to walk, yes hike if necessary, and should we not exert our influence with the moulders of fashion to give American youth a more sensible shoe? Proper shoes will result in better shaped, stronger and more muscular feet—normal feet. I once heard an instructor, a regular army officer, say that "the most beautiful feet in the world were to be seen at West Point." I did not grasp the full significance of his remark at the time, but I assure you that I had not been in the field a week when I discovered that there was more than poetry in his statement. I was sorry for myself and the men we were treating for blistered feet, fallen arches, corns, ingrowing nails, excoriations and abrasions.

Second in importance as a disabling factor for military service stands venereal diseases, affecting over 5.6 per cent of the draft.

Time was, when, as Surgeon General Ireland says, "the finger of scorn has been pointed at our army and navy because we had such a percentage of venereal diseases. The only reason we had a high percentage of venereal diseases was that we knew the amount and published it to the world." What did the draft reveal concerning our virile citizenship? Over 200,000 venereal cases brought in by the draft.

According to Colonel Vedder's calculation based on prior enlistments there were 71 to 82 out of every 100 who had venereal disease prior to enlistment. By way of comparison let us scrutinize a little more closely the skeleton in our national closet. From Colonel Vedder's survey of West Point cadets 5 per cent were syphilized before admission —admittedly our most perfect manhood, yet one out of 20 syphilitic to say nothing of previous gonorrohea and chancroid. Now set over against these army statistics the statement quoted by Colonel Ebert[4], from a report of the superintendent of the bureau of public health and hygiene, New York Association for Improving the Poor, and we find that about 22.5 per cent of all the men, women and children of New York City were treated in venereal clinics during the year 1913. These startling figures should arouse us to our duty as guardians of public health and spur us on to action and results.

It was in 1912 that Colonel Maus, champion of better morals for the army, wrote that, "The educated world has begun to realize that the three great social cankers—alcoholic addiction, prostitution and venereal diseases, must be met by scientific and rational measures. Why attempt longer to conceal in the closets of social life those ghasty skeletons which for centuries have been gradually but surely gnawing their way

to the very heart of human existence. Venereal diseases are intimately associated with two of the most prominent sociological problems of the age, alcoholic addiction and prostitution, and assisted by the increasing immoral tendency, will, if not checked, lead to a declining birth rate, degeneracy and possibly to race annihilation." The efforts of Colonel Maus bore fruit in the protection given our recruits from alcoholism and prostitution in the cantonments and their environs. Never in the history of our nation have such protective agencies been created and operated for lessening the temptations which ever beset the soldier. But why demand a world cataclysm to create such forces for health and morality? Why should not peace time industrial efficiency demand a like protection for our youth, male and female? Gentlemen of the medical profession, I hold that the answer is with you. Your sincere honest and zealous co-operation with the United States public health service's venereal campaign is imperative.

Tuberculosis

"There was no tuberculosis problem in France;" and why? Because years ago a patient and scientific worker, an army surgeon, had been slowly building up a system of medical preparedness in his specialty, such as General Upton advocated for the line. Colonel Bushnell, the army's chief expert on tuberculosis, was promptly called into the surgeon general's office when the war cloud broke and from that vantage point directed the work of the tuberculosis boards, which rejected after careful and repeated physical examinations thousands whom the local boards had passed on to them. More than 150,000 young men were rejected for tuberculosis, and while many still escaped detection, only to break down three or four months later, still so thorough had the tuberculosis survey been throughout all the camps that it may truthfully be said that there never was any tuberculosis problem in France.

However, the number of recruits rejected for tuberculosis or showing evidence of the disease within a few months after induction into service was so large as to shock our public as did no other one disease (influenza epidemic excepted). Public realization of the prevalence of tuberculosis among our youth as revealed by the war has changed the attitude of the American people toward tuberculosis. Not only has the result been educational, but timely efforts are being made for its control, state and national sanitoriums are being established and the laity and the medical profession are awakening to their responsibilities and opportunities.

Some Other Physical Defects

Such physical defects as hernia (4 per cent), defective vision (3⅓ per cent), hypertrophied tonsils (2⅓ per cent), defective physical development (3⅓ per cent), giving a total of 13 per cent, speak more eloquently than words for better prophylaxis and orthopedic measures for

our youth. At one time 10,000 hernias were awaiting operation. Note the change in attitude—the army's new policy of conservation. When the militia was called to the border in 1916 only emergency operations were allowed, the defects were disqualifying and eliminated the soldier from the service. After April, 1917, thousands were reclaimed for the service by surgery and other methods of conservation. Who, may I ask, was the beneficiary? The soldier, the army, the country, a striking illustration of what conservation may accomplish if given the opportunity. But again I ask, why demand a world cataclysm to force upon our youthful citizenship such rational measures for physical improvement?

Thus far we have noted only defects as reflected by war's mirror, fortunately there is a brighter side, forever to scintillate through the pages of our history. I refer to the achievements of the 65 per cent retained for service with the colors. These young men required only a few months' training to demonstrate to our allies their adaptability to the military game; in combat they became the *bete noir* of the enemy.

The methods of conservation, moral and physical, practiced by our government in every camp in the United States and in France gave results never before attained in our wars. However, as Colonel Ashburn[5] very aptly explains, we must not lay too much emphasis on the safeguards, the Red Cross, Y. M. C. A., Hebrew Welfare, Salvation Army, Knights of Columbus and Social Service, etc., nor yet upon military measures, as lectures, prophylaxis or punishment. We must go further back and place to the credit of the American youth a certain innate moral stamina which is ever indispensible to physical fitness. As Mr. Morgan of the sanitary corps so well expresses it, "The principal factor in the fight was character, the ideals the Yanks brought with them, something they had got long before they put on olive drab and were alloted an army serial number"[6].

I have made numerous observations of the American soldier; I have served with him on the Mexican border, under canvas, tormented by the tropical heat and dust storms in summer and snows and blasting winds in winter; I have served with him in one of the large training camps where he secured his first lessons in the art of war, awkward, embarrassed and quite out of tune with his new environment. I have been with him in the over-crowded, poorly equipped and ill-ventilated transports rushing succor to an "army with its back against the wall," a people trodden under a tyrant's heel; I have seen him crowding hospital trains and ships and in the hospitals of France; I have seen him in the forward areas (I was not privileged to see him in battle); knowing him so intimately, I would be remiss in my duty as an officer if I did not publicly acknowledge his soldierly attributes. We love and admire him for his manly determination, his cheerful patience, his surprising resourcefulness in each new situation, his never ceasing wit

and banter, his high sense of duty and respect for discipline, not a paragon, remember, but with all, the wonder and admiration of our country, a timely, dependable ally in the hour of crisis.

I will not speak further of this noble army of democracy, no words of mine can add one cubit to its stature, but I renew my plea for those who were rejected for service, the physically unfit. I ask your co-operation in reducing that 35 per cent to not over 10 per cent defectives. Your support of all conserving and health giving measures calculated to give us a higher peace time efficiency, a higher industrial efficiency at all times. A physical preparedness is urgently needed in these critical days of reconstruction. I ask that you lend your time and influence to these national and local mevements which have for their object the upbuilding of body and character. Included among these are dynamic forces such as the work of the United States Public Health Service, the physical examination of our public school children, better babies contests, the Y. M. C. A., and the Boy Scouts movement and many others. The potential forces are such as the National Tuberculosis association, the Child Welfare association, and indeed every county and state medical association, but whatever the field or method, their sphere of usefulness is unquestioned, their activity imperative.

Keep before the public the idea of physical fitness at all times, impress them with the need for national introspection such as would be revealed by periodic physical examinations of our children and youth for the purpose of early detection and eradication of disease. How better can we do this for our boys than by some form of universal military training? Not for the purpose of capitalizing our young manhood for war as did Germany, but rather to give us a physical survey each year of the youth of our land who have attained the training age. "Thus will there be scattered throughout the nation young men who have had impressed upon them in no uncertain terms the paramount importance of disease prevention and health promotion, who have seen the advantage of yielding cheerfully to reasonable health regulations. These young men will naturally assume the leading part in their community affairs during the next generation and with the guidance of public health departments of broader vision and larger resources, will materially influence the history of preventive medicine of the future" (Drake).[7]

Never was more required of the physician in the matter of preventive medicine, never was his co-operation in human conservation more in demand, never were his opportunities for service greater than today.

The Arizona Medical association has always stood for progress in medicine and public health. I have full confidence in your ability to make the most of the opportunities which lie at your door. Then indeed will the lessons of this war not have been lost upon a preoccupied people,

then indeed may we resolve "that these dead shall not have died in vain."

1 "The Military Policy of the United States," by Brevet Major General Emory Upton, United States army. Introduction.
2 The New York Evening Post, 1915.
3 "Physical and Hygienic Benefits of Military Training as Demonstrated by the War," Merritte W. Ireland, surgeon general United States army. Journal American Medical Association, February 21, 1920.
4 "Comments on the Army Venereal Problem," by Colonel R. G. Ebert, M. C., U. S. A. Military Surgeon, January, 1918.
5 "Factors Making for a Low Venereal Record in the American Expeditionary Force," P. M. Ashburn. J. A. M. A., December 13, 1919.
6 Military Surgeon, page 115, January, 1920.
7 "The Influence of the War in Preventive Medicine and Public Health," C. St. Clair Drake. J. A. M. A., September 13, 1919.

TUBERCULOSIS RESEARCH FELLOWSHIP, UNIVERSITY OF MINNESOTA

To encourage study of the means for the prevention and cure of tuberculosis the Hennepin County Tuberculosis association of Minneapolis, Minn., announces that it has set aside a fund for the support of a tuberculosis research fellowship in the graduate school of the University of Minnesota. The candidate for the fellowship must be a graduate of a Class A medical college. He will be expected to devote himself to research in some problem concerned with the causes, prevention or cure of tuberculosis. No teaching or other service will be required. The fellowship yields $750 the first year and progressively increasing amounts to be appropriated for the second and third years as conditions warrant. Inquiries and requests for application blanks should be addressed to the Dean of the Graduate College, University of Minnesota, Minneapolis, Minn.